

SEQUENCE LISTING

(1) GENERAL INFORMATION:

(i) APPLICANT: Trustees of the University of Pennsylvania
Wilson, James M.
Fisher, Krishna J.

(ii) TITLE OF INVENTION: Method for Recombinant Adeno-Associated
Virus-Directed Gene Therapy

(iii) NUMBER OF SEQUENCES: 4

(iv) CORRESPONDENCE ADDRESS:

(A) ADDRESSEE: Howson and Howson
(B) STREET: Spring House Corporate Cntr, PO Box 457
(C) CITY: Spring House
(D) STATE: Pennsylvania
(E) COUNTRY: USA
(F) ZIP: 19477

(v) COMPUTER READABLE FORM:

(A) MEDIUM TYPE: Floppy disk
(B) COMPUTER: IBM PC compatible
(C) OPERATING SYSTEM: PC-DOS/MS-DOS
(D) SOFTWARE: PatentIn Release #1.0, Version #1.30

(vi) CURRENT APPLICATION DATA:

(A) APPLICATION NUMBER: WO
(B) FILING DATE:
(C) CLASSIFICATION:

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/708,188
(B) FILING DATE: 06-SEP-1996

(vii) PRIOR APPLICATION DATA:

(A) APPLICATION NUMBER: US 08/729,061
(B) FILING DATE: 10-OCT-1996

(viii) ATTORNEY/AGENT INFORMATION:

(A) NAME: Kodroff, Cathy A.
(B) REGISTRATION NUMBER: 33,980
(C) REFERENCE/DOCKET NUMBER: GNPVN.019CIP2PCT

(ix) TELECOMMUNICATION INFORMATION:

(A) TELEPHONE: 215-540-9200
(B) TELEFAX: 215-540-5818

(2) INFORMATION FOR SEQ ID NO:1:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 10398 base pairs
(B) TYPE: nucleic acid
(C) STRANDEDNESS: double
(D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: cDNA

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

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|------------|-------------|-------------|------------|-------------|-------------|------|
| GAATTCGCTA | GCATCATCAA | TAATATAACCT | TATTTGGAT | TGAAGCCAAT | ATGATAATGA | 60 |
| GGGGGTGGAG | TTTGTGACGT | GGCGCGGGGC | GTGGGAACGG | GGCGGGTGAC | GTAGTAGTGT | 120 |
| GGCGGAAGTG | TGATGTTGCA | AGTGTGGCGG | AACACATGTA | ACCGACGGAT | GTGGCAAAAG | 180 |
| TGACGTTTT | GGTGTGCGCC | GGTGTACACA | GGAAGTGACA | ATTTTCGCGC | GGTTTTAGGC | 240 |
| GGATGTTGTA | GTAAATTGG | GCGTAACCGA | GTAAGATTG | GCCATTTCG | CGGGAAAAC | 300 |
| GAATAAGAGG | AAAGTGAATC | TGAATAATT | TGTGTTACTC | ATAGCGCGTA | ATATTGTCT | 360 |
| AGGGAGATCT | GCTGCGCGCT | CGCTCGCTCA | CTGAGGCCGC | CCGGGCAAAG | CCCGGGCGTC | 420 |
| GGGCGACCTT | TGGTCGCCCC | GCCTCAGTGA | GCGAGCGAGC | GGCGAGAGAG | GGAGTGGCCA | 480 |
| ACTCCATCAC | TAGGGTTCC | TTGTAGTTAA | TGATTAACCC | GCCATGCTAC | TTATCTACAA | 540 |
| TTCGAGCTTG | CATGCCCTGCA | GGTCGTTACA | TAACTTACGG | TAAATGGCCC | GCCTGGCTGA | 600 |
| CCGCCCAACG | ACCCCCGCC | ATTGACGTCA | ATAATGACGT | ATGTTCCCAT | AGTAACGCCA | 660 |
| ATAGGGACTT | TCCATTGACG | TCAATGGGTG | GAGTATTAC | GGTAAACTGC | CCACTTGGCA | 720 |
| GTACATCAAG | TGTATCATAT | GCCAAGTACG | CCCCCTATTG | ACGTCAATGA | CGGTAAATGG | 780 |
| CCCGCCTGGC | ATTATGCCCA | GTACATGACC | TTATGGACT | TTCCTACTTG | GCAGTACATC | 840 |
| TACGTATTAG | TCATCGCTAT | TACCATGGTG | ATGCGTTTT | GGCAGTACAT | CAATGGCGT | 900 |
| GGATAGCGGT | TTGACTCACG | GGGATTCCA | AGTCTCCACC | CCATTGACGT | CAATGGGAGT | 960 |
| TTGTTTGGC | ACCAAAATCA | ACGGGACTTT | CCAAAATGTC | GTAACAACTC | CGCCCCATTG | 1020 |
| ACGCAAATGG | GCGGTAGGCG | TGTACGGTGG | GAGGTCTATA | TAAGCAGAGC | TCGTTTAGTG | 1080 |
| AACCGTCAGA | TCGCCTGGAG | ACGCCATCCA | CGCTGTTTG | ACCTCCATAG | AAGACACCGG | 1140 |
| GACCGATCCA | GCCTCCGGAC | TCTAGAGGAT | CCGGTACTCG | AGGAACTGAA | AAACCCAGAAA | 1200 |
| GTAAACTGGT | AAGTTTAGTC | TTTTGTCTT | TTATTCAGG | TCCC GGATCC | GGTGGTGGTG | 1260 |
| CAAATCAAAG | AACTGCTCCT | CAGTGGATGT | TGCCTTACT | TCTAGGCCTG | TACGGAAGTG | 1320 |
| TTACTTCTGC | TCTAAAAGCT | GCGGAATTGT | ACCCGGGCC | GCAATTCCCG | GGGATCGAAA | 1380 |
| GAGCCTGCTA | AAGCAAAAAA | GAAGTCACCA | TGTGTTTAC | TTTGACCAAC | AAGAACGTGA | 1440 |
| TTTCGTTGC | CGGTCTGGGA | GGCATTGGTC | TGGACACCAG | CAAGGAGCTG | CTCAAGCGCC | 1500 |
| ATCCCCTCGT | TTTACAACGT | CGTGACTGGG | AAAACCTGG | CGTTACCCAA | CTTAATCGCC | 1560 |
| TTGCAGCACA | TCCCCCTTTC | GCCAGCTGGC | GTAATAGCGA | AGAGGCCCGC | ACCGATCGCC | 1620 |
| CTTCCCAACA | GTTGCGCAGC | CTGAATGGCG | AATGGCGCTT | TGCCTGGTT | CCGGCACCAAG | 1680 |
| AAGCGGTGCC | GGAAAGCTGG | CTGGAGTGC | ATCTTCTGA | GGCCGATACT | GTCGTCGTCC | 1740 |
| CCTCAAAC | GCAGATGCAC | GGTTACGATG | CGCCCATCTA | CACCAACGTA | ACCTATCCCA | 1800 |
| TTACGGTCAA | TCCGCCGTTT | GTTCCCACGG | AGAATCCGAC | GGGTTGTTAC | TCGCTCACAT | 1860 |

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|------------|-------------|--------------|-------------|-------------|-------------|------|
| TTAATGTTGA | TGAAAGCTGG | CTACAGGAAG | GCCAGACGCG | AATTATTTT | GATGGCGTTA | 1920 |
| ACTCGGCGTT | TCATCTGTGG | TGCAACGGGC | GCTGGGTCGG | TTACGGCCAG | GACAGTCGTT | 1980 |
| TGCCGTCTGA | ATTTGACCTG | AGCGCATTTC | TACCGGCCGG | AGAAAACCGC | CTCGCGGTGA | 2040 |
| TGGTGCTGCC | TTGGAGTGAC | GGCAGTTATC | TGGAAGATCA | GGATATGTGG | CGGATGAGCG | 2100 |
| GCATTTCCG | TGACGTCTCG | TTGCTGCATA | AACCGACTAC | ACAAATCAGC | GATTTCCATG | 2160 |
| TTGCCACTCG | CTTTAATGAT | GATTCAGCC | GCGCTGTACT | GGAGGCTGAA | GTTCAGATGT | 2220 |
| GCAGCGAGTT | CGCGTACTAC | CTACGGTAA | CAGTTTCTTT | ATGGCAGGGT | GAAACGCAGG | 2280 |
| TCGCCAGCGG | CACCGCGCCT | TTCGGCGGTG | AAATTATCGA | TGAGCGTGGT | GGTTATGCCG | 2340 |
| ATCGCGTCAC | ACTACGTCTG | AACGTCGAAA | ACCCGAAACT | GTGGAGCGCC | GAAATCCCGA | 2400 |
| ATCTCTATCG | TGCGGTGGTT | GAAC TGACACA | CCGCCGACGG | CACGCTGATT | GAAGCAGAAG | 2460 |
| CCTCGATGT | CGGTTCCGC | GAGGTGCGGA | TTGAAAATGG | TCTGCTGCTG | CTGAACGGCA | 2520 |
| AGCCGTTGCT | GATTGAGGC | GTAAACCGTC | ACGAGCATCA | TCCTCTGCAT | GGTCAGGTCA | 2580 |
| TGGATGAGCA | GACGATGGTG | CAGGATATCC | TGCTGATGAA | GCAGAACAAAC | TTAACGCCG | 2640 |
| TGCGCTGTT | GCATTATCCG | AACCATCCGC | TGTGGTACAC | GCTGTGCGAC | CGCTACGGCC | 2700 |
| TGTATGTGGT | GGATGAAAGCC | AATATTGAAA | CCCACGGCAT | GGTGCCAATG | AATCGTCTGA | 2760 |
| CCGATGATCC | GCGCTGGCTA | CCGGCGATGA | GCGAACCGGT | AACGCGAATG | GTGCAGCGCG | 2820 |
| ATCGTAATCA | CCCGAGTGTG | ATCATCTGGT | CGCTGGGAA | TGAATCAGGC | CACGGCGCTA | 2880 |
| ATCACGACGC | GCTGTATCGC | TGGATCAAAT | CTGTCGATCC | TTCCCGCCCG | GTGCAGTATG | 2940 |
| AAGGCGGCCG | AGCCGACACC | ACGGCCACCG | ATATTATTTG | CCCGATGTAC | GCGCGCGTGG | 3000 |
| ATGAAGACCA | GCCCTTCCCG | GCTGTGCCGA | AATGGTCCAT | AAAAAAATGG | CTTCGCTAC | 3060 |
| CTGGAGAGAC | GCGCCCGCTG | ATCCTTGCG | AATACGCCA | CGCGATGGGT | AACAGTCTTG | 3120 |
| GCGGTTTCGC | TAAATACTGG | CAGGCGTTTC | GTCAGTATCC | CCGTTTACAG | GGCGGCTTCG | 3180 |
| TCTGGGACTG | GGTGGATCAG | TCGCTGATTA | AATATGATGA | AAACGGCAAC | CCGTGGTCGG | 3240 |
| CTTACGGCGG | TGATTTGGC | GATACGCCGA | ACGATCGCCA | GTTCTGTATG | AACGGTCTGG | 3300 |
| TCTTGCCGA | CCGCACGCCG | CATCCAGCGC | TGACGGAAGC | AAAACACCAAG | CAGCAGTTTT | 3360 |
| TCCAGTTCCG | TTTATCCGGG | CAAACCATCG | AAGTGACCAAG | CGAATACCTG | TTCCGTCATA | 3420 |
| GCGATAACGA | GCTCCTGCAC | TGGATGGTGG | CGCTGGATGG | TAAGCCGCTG | GCAAGCGGTG | 3480 |
| AAGTGCCTCT | GGATGTCGCT | CCACAAGGTA | AACAGTTGAT | TGAAC TGCC | GAAC TACCGC | 3540 |
| AGCCGGAGAG | CGCCGGGCAA | CTCTGGCTCA | CAGTACCGGT | AGTGCAACCG | AACGCGACCG | 3600 |
| CATGGTCAGA | AGCCGGGCAC | ATCAGCGCCT | GGCAGCAGTG | GCGTCTGGCG | GAAAACCTCA | 3660 |
| GTGTGACGCT | CCCCGCCGCG | TCCCACGCCA | TCCCCCATCT | GACCACCAAGC | GAAATGGATT | 3720 |
| TTTGCATCGA | GCTGGGTAAT | AAGCGTTGGC | AATTAAACCG | CCAGTCAGGC | TTTCTTTCAC | 3780 |

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| AGATGTGGAT TGGCGATAAA AAACAACCTGC TGACGCCGCT GCGCGATCAG TTCACCCGTG | 3840 |
| CACCGCTGGA TAACGACATT GCGCTAAGTG AAGCGACCCG CATTGACCCCT AACGCCCTGGG | 3900 |
| TCGAACGCTG GAAGGGGGCG GGCCATTACC AGGCCGAAGC AGCGTTGTTG CAGTGCACGG | 3960 |
| CAGATACT TGCTGATGCG GTGCTGATTA CGACCGCTCA CGCGTGGCAG CATCAGGGGA | 4020 |
| AAACCTTATT TATCAGCCGG AAAACCTACC GGATTGATGG TAGTGGTCAA ATGGCGATTA | 4080 |
| CCGTTGATGT TGAAGTGGCG AGCGATACAC CGCATCCGGC GCGGATTGGC CTGAACTGCC | 4140 |
| AGCTGGCGCA GGTAGCAGAG CGGGTAAACT GGCTCGGATT AGGGCCGCAA GAAAACATATC | 4200 |
| CCGACCGCCT TACTGCCGCC TGTTTGACC GCTGGATCT GCCATTGTCA GACATGTATA | 4260 |
| CCCCGTACGT CTTCCCGAGC GAAAACGGTC TCGCCTGCGG GACGCGCGAA TTGAATTATG | 4320 |
| GCCCCACACCA GTGGCGCGGC GACTTCCAGT TCAACATCAG CCGCTACAGT CAACAGCAAC | 4380 |
| TGATGGAAAC CAGCCATCGC CATCTGCTGC ACGCGGAAGA AGGCACATGG CTGAATATCG | 4440 |
| ACGGTTCCA TATGGGGATT GGTGGCGACG ACTCCTGGAG CCCGTCAGTA TCGGCGGAAT | 4500 |
| TACAGCTGAG CGCCGGTCGC TACCATTAACC AGTTGGTCTG GTGTCAAAAA TAATAATAAC | 4560 |
| CGGGCAGGCC ATGTCTGCC GTATTCGCG TAAGGAAATC CATTATGTAC TATTTAAAAA | 4620 |
| ACACAAACTT TTGGATGTTG GGTTTATTCT TTTCTTTTA CTTTTTTATC ATGGGAGCCT | 4680 |
| ACTTCCCGTT TTTCCCGATT TGGCTACATG ACATCAACCA TATCAGCAA AGTGTACCGG | 4740 |
| GTATTATTT TGCCGCTATT TCTCTGTTCT CGCTATTATT CCAACCGCTG TTTGGTCTGC | 4800 |
| TTTCTGACAA ACTCGGCCTC GACTCTAGGC GGCCCGGGGG ATCCAGACAT GATAAGATAC | 4860 |
| ATTGATGAGT TTGGACAAAC CACAACATAGA ATGCAGTGAA AAAAATGCTT TATTTGTGAA | 4920 |
| ATTGTGATG CTATTGCTTT ATTGTAAACC ATTATAAGCT GCAATAAACAA AGTTAACAAAC | 4980 |
| AACAATTGCA TTCATTTAT GTTTCAGGTT CAGGGGGAGG TGTGGGAGGT TTTTCGGAT | 5040 |
| CCTCTAGAGT CGAGTAGATA AGTAGCATGG CGGGTTAACATC ATTAACATACA AGGAACCCCT | 5100 |
| AGTGATGGAG TTGGCCACTC CCTCTCTGCG CGCTCGCTCG CTCACTGAGG CCGGGCGACC | 5160 |
| AAAGGTCGCC CGACGCCCGG GCTTGCCTCG GGCGGCCTCA GTGAGCGAGC GAGCGCGCAG | 5220 |
| CAGATCTGGA AGGTGCTGAG GTACGATGAG ACCCGCACCA GGTGCAGACC CTGCGAGTGT | 5280 |
| GGCGGTAAAC ATATTAGGAA CCAGCCTGTG ATGCTGGATG TGACCGAGGA GCTGAGGCC | 5340 |
| GATCACTTGG TGCTGGCCTG CACCCCGCGT GAGTTGGCT CTAGCGATGA AGATAACAGAT | 5400 |
| TGAGGTACTG AAATGTGTGG GCGTGGCTTA AGGGTGGAA AGAATATATA AGGTGGGGGT | 5460 |
| CTTATGTAGT TTTGTATCTG TTTGCAGCA GCCGCCGCCG CCATGAGCAC CAACTCGTTT | 5520 |
| GATGGAAGCA TTGTGAGCTC ATATTGACA ACGCGCATGC CCCCATGGGC CGGGGTGCCT | 5580 |
| CAGAATGTGA TGGGCTCCAG CATTGATGGT CGCCCCGTCC TGCCCGCAA CTCTACTACC | 5640 |
| TTGACCTACG AGACCGTGTC TGGAACGCCG TTGGAGACTG CAGCCTCCGC CGCCGCTTCA | 5700 |

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| GCCGCTGCAG | CCACCGCCCCG | CGGGATTGTG | ACTGACTTTG | CTTCCTGAG | CCCGCTTGCA | 5760 |
| AGCAGTGCAG | CTTCCCGTTC | ATCCGCCGC | GATGACAAGT | TGACGGCTCT | TTTGGCACAA | 5820 |
| TTGGATTCTT | TGACCCGGGA | ACTTAATGTC | GTTTCTCAGC | AGCTGTTGGA | TCTGCGCCAG | 5880 |
| CAGGTTTCTG | CCCTGAAGGC | TTCCTCCCT | CCCAATGCGG | TTTAAAACAT | AAATAAAAAAA | 5940 |
| CCAGACTCTG | TTTGGATTG | GATCAAGCAA | GTGTCTTGCT | GTCTTATT | AGGGGTTTG | 6000 |
| CGCGCGCGGT | AGGCCCGGGA | CCAGCGGTCT | CGGTGTTGA | GGGTCTGTG | TATTTTTCC | 6060 |
| AGGACGTGGT | AAAGGTGACT | CTGGATGTT | AGATACATGG | GCATAAGCCC | GTCTCTGGGG | 6120 |
| TGGAGGTAGC | ACCACTGCAG | AGCTTCATGC | TGCGGGGTGG | TGTTGTAGAT | GATCCAGTCG | 6180 |
| TAGCAGGAGC | GCTGGCGTG | GTGCCTAAA | ATGTCTTCA | GTAGCAAGCT | GATTGCCAGG | 6240 |
| GGCAGGCCCT | TGGTGTAACT | GTTCACAAAG | CGGTTAACGCT | GGGATGGGTG | CATACGTGGG | 6300 |
| GATATGAGAT | GCATCTTGGA | CTGTATTTT | AGGTTGGCTA | TGTTCCCAGC | CATATCCCTC | 6360 |
| CGGGGATTCA | TGTTGTGCAG | AACCACCAGC | ACAGTGTATC | CGGTGCACCT | GGGAAATTG | 6420 |
| TCATGTAGCT | TAGAAGGAAA | TGCGTGGAAAG | AACTTGGAGA | CGCCCTTGTG | ACCTCCAAGA | 6480 |
| TTTCCATGC | ATTCGTCCAT | AATGATGGCA | ATGGGCCAC | GGCGGGCGGC | CTGGGCGAAG | 6540 |
| ATATTCCTGG | GATCACTAAC | GTCATAGTTG | TGTTCCAGGA | TGAGATCGTC | ATAGGCCATT | 6600 |
| TTTACAAAGC | CGGGCGGGAG | GGTGCCAGAC | TGCGGTATAA | TGGTTCCATC | CGGCCAGGG | 6660 |
| GCGTAGTTAC | CCTCACAGAT | TTGCATTTC | CACGCTTGA | GTTCAGATGG | GGGGATCATG | 6720 |
| TCTACCTGCG | GGCGATGAA | AAAAACGTT | TCCGGGGTAG | GGGAGATCAG | CTGGGAAGAA | 6780 |
| AGCAGGTTCC | TGAGCAGCTG | CGACTTACCG | CAGCCGGTGG | GCCCCTAAAT | CACACCTATT | 6840 |
| ACCGGGTGCA | ACTGGTAGTT | AAGAGAGCTG | CAGCTGCCGT | CATCCCTGAG | CAGGGGGGCC | 6900 |
| ACTTCGTTAA | GCATGTCCCT | GACTCGCATG | TTTCCCTGA | CCAAATCCGC | CAGAAGGCC | 6960 |
| TCGCCGCCCA | GCGATAGCAG | TTCTTGCAAG | GAAGCAAAGT | TTTCAACGG | TTTGAGACCG | 7020 |
| TCCGCCGTAG | GCATGCTTT | GAGCGTTGA | CCAAGCAGTT | CCAGGCGGTC | CCACAGCTCG | 7080 |
| GTCACCTGCT | CTACGGCATH | TCGATCCAGC | ATATCTCCTC | GTTCGCGGG | TTGGGGCGGC | 7140 |
| TTTCGCTGTA | CGGCAGTAGT | CGGTGCTCGT | CCAGACGGGC | CAGGGTCATG | TCTTCCACG | 7200 |
| GGCGCAGGGT | CCTCGTCAGC | GTAGTCTGGG | TCACGGTGA | GGGGTGCCT | CCGGGCTGCC | 7260 |
| CGCTGGCCAG | GGTGCCTTG | AGGCTGGTC | TGCTGGTGT | GAAGCGCTGC | CGGTCTTCC | 7320 |
| CCTCGCGTC | GGCCAGGTAG | CATTGACCA | TGGTGTATA | GTCCAGCCCC | TCCGCGGGCGT | 7380 |
| GGCCCTTGGC | GCGCAGCTG | CCCTTGGAGG | AGGCGCCGCA | CGAGGGCAG | TGCAACTT | 7440 |
| TGAGGGCGTA | GAGCTTGGC | GCGAGAAATA | CCGATTCCGG | GGAGTAGGCA | TCCGCGCCGC | 7500 |
| AGGCCCCGCA | GACGGTCTCG | CATTCCACGA | GCCAGGTGAG | CTCTGGCCGT | TCGGGGTCAA | 7560 |
| AAACCAGGTT | TCCCCCATGC | TTTTGATGC | GTTCCTTACC | TCTGGTTTCC | ATGAGCCGGT | 7620 |

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|------------|------------|-------------|------------|-------------|-------------|------------|------|
| GTCCACGCTC | GGTGACGAAA | AGGCTGTCCG | TGTCCCCGTA | TACAGACTTG | AGAGGCCTGT | 7680 | |
| CCTCGACCGA | TGCCCTTGAG | AGCCTTCAAC | CCAGTCAGCT | CCTTCCGGTG | GGCGCGGGGC | 7740 | |
| ATGACTATCG | TCGCCGCACT | TATGACTGTC | TTCTTATCA | TGCAACTCGT | AGGACAGGTG | 7800 | |
| CCGGCAGCGC | TCTGGGTCAT | TTTCGGCGAG | GACCGCTTTC | GCTGGAGCGC | GACGGATGATC | 7860 | |
| GGCCTGTCGC | TTGCGGTATT | CGGAATCTTG | CACGCCCTCG | CTCAAGCCTT | CGTCACTGGT | 7920 | |
| CCCGCCACCA | AACGTTTCGG | CGAGAAGCAG | GCCATTATCG | CCGGCATGGC | GGCCGACGCG | 7980 | |
| CTGGGCTACG | TCTTGCTGGC | GTTCGCGACG | CGAGGCTGGA | TGGCCTTCCC | CATTATGATT | 8040 | |
| CTTCTCGCTT | CCGGCGGCAT | CGGGATGCC | GCGTTGCAGG | CCATGCTGTC | CAGGCAGGTA | 8100 | |
| GATGACGACC | ATCAGGGACA | GCTTCAAGGA | TCGCTCGCGG | CTCTTACCAAG | CCTAACTTCG | 8160 | |
| ATCACTGGAC | CGCTGATCGT | CACGGCGATT | TATGCCGCCT | CGGCGAGCAC | ATGGAACGGG | 8220 | |
| TTGGCATGGA | TTGTAGGC | CGCCCTATAAC | CTTGTCTGCC | TCCCCGCGTT | GCCTCGCGGT | 8280 | |
| GCATGGAGCC | GGGCCACCTC | GACCTGAATG | GAAGCCGGCG | GCACCTCGCT | AACGGATTCA | 8340 | |
| CCACTCCAAG | AATTGGAGCC | AATCAATTCT | TGCGGAGAAC | TGTGAATGCG | CAAACCAACC | 8400 | |
| CTTGGCAGAA | CATATCCATC | GCGTCCGCCA | TCTCCAGCAG | CCGCACGCCG | CGCATCTCGG | 8460 | |
| GCACCGTTGG | GTCCTGGCCA | CGGGTGC | TGATCGTGCT | CCTGTCGTTG | AGGACCCGGC | 8520 | |
| TAGGCTGGCG | GGGTTGCCTT | ACTGGTTAGC | AGAATGAATC | ACCGATACGC | GAGCGAACGT | 8580 | |
| GAAGCGACTG | CTGCTGCAAA | ACGTCTGCGA | CCTGAGAAC | AACATGAATG | GTCTTCGGTT | 8640 | |
| TCCGTGTTTC | GTAAAGTCTG | GAAACGCGGA | AGTCAGCGCC | CTGCACCATT | ATGTTCCGGA | 8700 | |
| TCTGCATCGC | AGGATGCTGC | TGGCTACCC | GTGGAACACC | TACATCTGTA | TTAACGAAGC | 8760 | |
| CTTTCTCAAT | GCTCACGCTG | TAGGTATCTC | AGTTGGTGT | AGGTCGTTCG | CTCCAAGCTG | 8820 | |
| GGCTGTGTGC | ACGAACCCCC | CGTTCA | GACCGCTGCG | CCTTATCCGG | TAACTATCGT | 8880 | |
| CTTGAGTCCA | ACCCGGTAAG | ACACGACTTA | TCGCCACTGG | CAGCAGCCAC | TGGTAACAGG | 8940 | |
| ATTAGCAGAG | CGAGGTATGT | AGGC | GGTGCT | ACAGAGTTCT | TGAAGTGGTG | GCCTAACTAC | 9000 |
| GGCTACACTA | GAAGGACAGT | ATTGGTATC | TGCGCTCTGC | TGAAGCCAGT | TACCTTCGGA | 9060 | |
| AAAAGAGTTG | GTAGCTCTG | ATCCGGAAA | CAAACCACCG | CTGGTAGCGG | TGGTTTTTTT | 9120 | |
| TTTGCAAGC | AGCAGATTAC | GCGCAGAAA | AAAGGATCTC | AAGAAGATCC | TTTGATCTTT | 9180 | |
| TCTACGGG | CTGACGCTCA | GTGGAACGAA | AACTCACGTT | AAGGGATT | GGTCATGAGA | 9240 | |
| TTATCAAAA | GGATCTTCAC | CTAGATCCTT | TTAAATTAAA | AATGAAGTTT | TAAATCAATC | 9300 | |
| TAAAGTATAT | ATGAGTAAAC | TTGGTCTGAC | AGTTACCAAT | GCTTAATCAG | TGAGGCACCT | 9360 | |
| ATCTCAGCGA | TCTGTCTATT | TCGTTCATCC | ATAGTTGCCT | GACTCCCCGT | CGTGTAGATA | 9420 | |
| ACTACGATA | GGGAGGGCTT | ACCATCTGGC | CCCAGTGCTG | CAATGATACC | GCGAGACCCA | 9480 | |
| CGCTCACCGG | CTCCAGATTT | ATCAGCAATA | AACCAGCCAG | CCGGAAGGGC | CGAGCGCAGA | 9540 | |

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|---|-------|
| AGTGGTCCTG CAACTTTATC CGCCTCCATC CAGTCTATTA ATTGTTGCCG GGAAGCTAGA | 9600 |
| GTAAGTAGTT CGCCAGTTAA TAGTTGCGC AACGTTGTTG CCATTGCTGC AGGCATCGTG | 9660 |
| GTGTCACGCT CGTCGTTGG TATGGCTTCA TTCAGCTCCG GTTCCCAACG ATCAAGGCAG | 9720 |
| GTTACATGAT CCCCCATGTT GTGCAAAAAA GCGGTTAGCT CCTTCGGTCC TCCGATCGTT | 9780 |
| GTCAGAAGTA AGTTGGCCGC AGTGTATCA CTCATGGTTA TGGCAGCACT GCATAATTCT | 9840 |
| CTTACTGTCA TGCCATCCGT AAGATGCTTT TCTGTGACTG GTGAGTACTC AACCAAGTCA | 9900 |
| TTCTGAGAAT AGTGTATGCC GCGACCGAGT TGCTCTGCC CGCGTCAAC ACGGGATAAT | 9960 |
| ACCGCGCCAC ATAGCAGAAC TTTAAAAGTG CTCATCATTG GAAAACGTTT TTCGGGGCGA | 10020 |
| AAACTCTCAA GGATCTTACC GCTGTTGAGA TCCAGTTCGA TGTAACCCAC TCGTGCACCC | 10080 |
| AACTGATCTT CAGCATCTT TACTTTCACC AGCGTTCTG GGTGAGCAAA AACAGGAAGG | 10140 |
| CAAAATGCCG CAAAAAAGGG AATAAGGGCG ACACGGAAAT GTTGAATACT CATACTCTTC | 10200 |
| CTTTTCAAT ATTATTGAAG CATTATCAG GGTTATTGTC TCATGAGCGG ATACATATT | 10260 |
| GAATGTATT AGAAAAATAA ACAAAATAGGG GTTCCCGCGA CATTCCCCG AAAAGTGCCA | 10320 |
| CCTGACGTCT AAGAAACCAT TATTATCATG ACATTAACCT ATAAAAATAG GCGTATCACG | 10380 |
| AGGCCCTTC GTCTCAA | 10398 |

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: other nucleic acid

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

CATGGTAATA GCGATGACTA

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(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 - (A) LENGTH: 20 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: other nucleic acid

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

GCTCTGCTTA TATAGACCTC

20

(2) INFORMATION FOR SEQ ID NO:4:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: unknown

(ii) MOLECULE TYPE: other nucleic acid

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

ATAAGCTGCA ATAAACAAGT

20